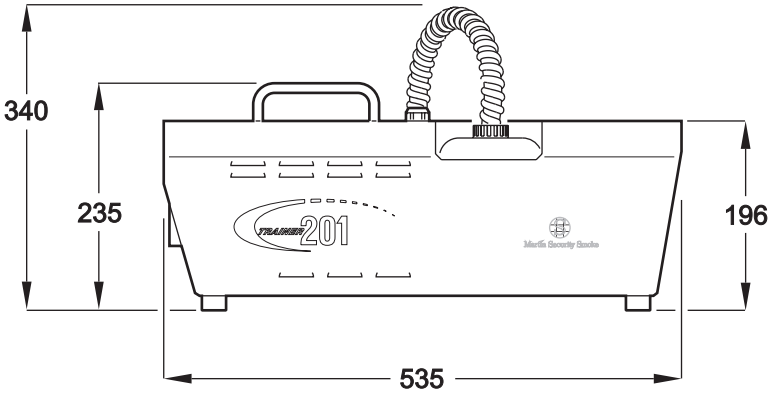
Trainer™

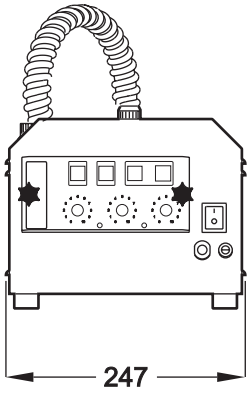
USER MANUAL

TRAINER 201

Dimensions

All dimensions are in millimeters





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P/N 35000180C

Safety information

The following symbols are used to identify important safety information:

Danger! Safety hazard. Risk of personal injury.

Danger! Hazardous voltage. Contact will cause electric shock.

Caution! Burn hazard. Hot surface. Do not touch.

Caution! Fire hazard.

DANGER! This product is not for household use.

Read this manual before operating the machine, follow the safety precautions listed below, and observe all warnings in this manual and printed on the machine. Use the machine only as described in this manual and in accordance with local laws and regulations. Refer any service operation not described in this manual to a qualified technician.

If you have questions about how to operate the machine safely, or if you have followed the instructions in this manual but still believe that the machine is malfunctioning, please contact MSS Professional on (+44) 1604 839 000 or (+45) 87 400 000.

Preventing electric shocks

- Always ground (earth) the machine electrically.
- The machine may only be connected to AC power via the power cable supplied with the machine or a replacement supplied and installed by MSS Professional.
- Use only a source of AC power that complies with local building and electrical codes, and that has both overload and ground-fault protection.
- Before connecting the machine to power, check that the voltage range indicated on the machine's serial label matches your local AC power voltage. If your AC power voltage is outside the range indicated, do not use the machine. Contact MSS Professional for assistance.
- Before using the machine, check that all power distribution equipment and cables are in perfect condition and rated for the current requirements of all connected devices.

- If the machine or any cables connected to it are in any way damaged, defective, wet, or show signs of overheating, stop using the machine and contact MSS Professional for assistance.
- Disconnect the machine from AC power before refilling or changing the fluid container, before servicing, and when not in use.
- This machine is water-resistant but not totally waterproof. Do not immerse in water or any other liquid. Do not expose to high-pressure water jets.
- Do not spill fluid over the machine. If fluid is spilled, clean the machine with a damp cloth. If fluid is spilled onto electronic parts, contact MSS Professional for advice.
- Do not remove the covers or attempt to repair a faulty machine. Refer any service not described in this manual to MSS Professional.
- Do not operate the machine if any parts are damaged, defective or missing.

Preventing burns and fire

- The smoke expelled from the output nozzle is hot enough to cause burns, and very hot droplets of fluid occasionally escape from the nozzle area. Keep people and objects at least 1 m (40 inches) away from the nozzle.

- Do not touch the smoke output nozzle area during or after use; it may stay hot for several hours after the machine has been used.
- Provide a minimum free space of 10 cm (4 inches) around the machine and ensure free and unobstructed air flow to and around the machine.
- Keep the machine at least 60 cm (24 inches) away from combustible and heat-sensitive materials.
- Do not attempt to bypass thermostatic switches, fluid sensors or fuses.
- Replace fuses only with ones of the type and rating specified in this manual and on the machine for the local AC power voltage.
- Do not operate the machine if the ambient temperature (T_a) is below 5° C (41° F) or above 40° C (104° F).
- Do not operate the machine if the relative air humidity exceeds 80%.
- Do not recycle dense smoke into the machine.

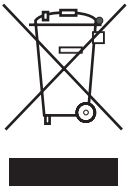
Preventing injuries

- Ensure that the surface on which the machine is installed can safely hold the weight of the machine.
- Suspending the machine directly over people's heads is not recommended. Use smoke ducting instead.
- Do not point smoke output directly at a person's face or at face height.
- Smoke machines can cause condensation. If smoke concentration is high for extended periods, floors and surfaces may become slippery. Wipe dry as necessary to avoid any danger of slipping.

- Smoke fluid contains food-grade glycols in solution but may present health risks if swallowed. Do not drink it. Store it securely. If eye contact occurs, rinse with water. If fluid is swallowed, give water and obtain medical advice.

Preventing breathing problems

- A smoke machine can operate safely only with the exact type of smoke fluid it was designed for. Use the machine only with Martin Security Smoke Trainer Fluid or you may cause the release of toxic gases, presenting a severe health hazard. You will also probably damage the machine.

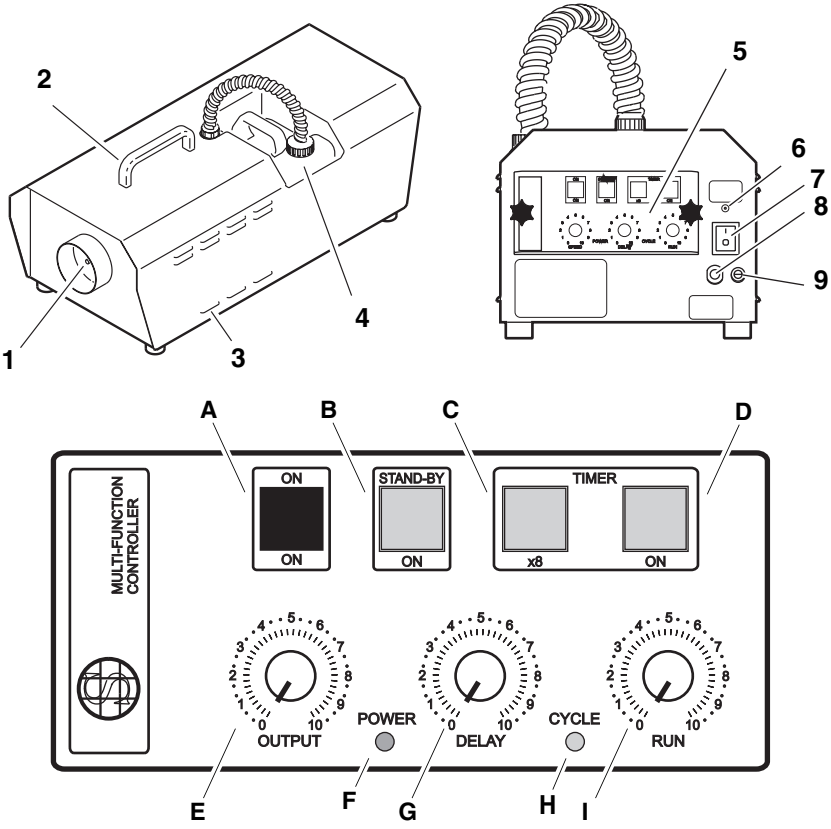


Disposing of this product

MSS Professional products are supplied in compliance with Directive 2002/96/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), as amended by Directive 2003/108/EC, where applicable.

Help preserve the environment! Ensure that this product is recycled at the end of its life. Your supplier can give details of local arrangements for the disposal of MSS Professional products.

Product overview



Machine

1 Output nozzle
2 Carrying handle
3 Air vents
4 Fluid container
5 Multifunction remote control
6 READY LED
7 Power on/off switch
8 Power cable entry
9 Main fuseholder

Remote control unit

A Instant smoke output
B Stand-by (set to ON to operate)
C Timer value multiplier
D Timer engage
E Smoke output level
F Power indicator
G Delay (sets intervals between output)
H Timer operation indicator
I Output (sets output periods)

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Introduction

The Trainer 201 from MSS Professional is a versatile smoke and fog generator for professional use. It can produce a variety of effects from an optically translucent haze to a dense 'white-out' that very effectively simulates dense smoke for realistic firefighter training. The powerful output makes the Trainer 201 highly suitable for distributing smoke via ducting.

The Trainer 201 has been designed to cope with the rigors of training, with a tough outer casing and rugged water-resistant design.

A total fluid capacity of 2.5 liters (5.3 US pints/4.4 Imp. pints) ensures good autonomy between refills.To allow safe and reliable operation, a direct ceramic thermal cutout system shuts down the machine in the event of overheating.

The Trainer 201 is controlled using a multifunction cable remote control unit that is supplied with the machine. The remote can be conveniently fastened in an onboard docking station.

Details of the full range of MSS Professional training products are available on the MSS Professional website at: http://www.training-smoke.com.

Features

The Trainer 201 features:

- Multifunction cable remote control (supplied) with instant or timer-controlled output and onboard docking station
- Variable smoke output level up to 500 cubic meters (17 600 cubic ft.) per minute
- 1kW heat exchanger, giving high output from a compact vaporizing system
- DTP direct ceramic overheat protection
- 2.5 liters (5.3 US pints/4.4 Imp. pints) onboard fluid capacity
- High power piston pump
- Pump ramping for continuous output
- Heavy duty construction
- Water resistant design
- Optional 4 inch smoke ducting adaptor kit

Installation

DANGER! Do not try to install the Trainer 201 until you have read and observed all the precautions listed in "*Safety information*" on page 3.

Unpacking

Unpack and check the machine.

The Trainer 201 is supplied with:

- Multifunction remote control with 6 m (19.5 ft.) cable
- 2.5 liters (5.3 US pints/4.4 Imp. pints) smoke fluid container
- Power cable (a suitable power plug must be supplied by the user)

Machine location

The Trainer 201 must be placed securely on a level, stable surface that can safely support its weight. Installing the machine above people's heads is not recommended. If smoke output above ground level is required, the easiest solution is to use flexible smoke ducting.

Ensure that there is a minimum free space of 10 cm (4 inches) around the machine, unobstructed air flow around the machine, minimum 1 m (40 inches) free space in front of the nozzle and a minimum distance of 60 cm (24 inches) to combustible materials (wood, paper, etc.).

AC power

The Trainer 201 is available in two models:

- The 115 V model accepts 110-120 V, 60 Hz nominal AC power
- The 230 V model accepts 220-240 V, 50 Hz nominal AC power

Both models are supplied with a 2 meter (6.5 ft.) power cable. Before using the machine, a grounding-type (earthed) power plug that fits the local power outlets must be obtained locally and installed on the power cable.

DANGER! Make sure the power plug is correctly rated:

- **115 V models must be fitted with a plug rated 15 amp minimum**
- **230 V models must be fitted with a plug rated 6.3 amp minimum**

When installing the plug, follow the plug manufacturer's instructions and connect pins as follows: yellow and green wire to ground (earth), blue wire to neutral and brown wire to live.

The table below shows some common pin identification schemes.

Wire	Pin	Marking	Screw color
brown	live	"L"	yellow or brass
blue	neutral	"N"	silver
yellow/green	ground (earth)	⏚	green

Before connecting the Trainer 201 to power, check that the voltage range indicated on the machine's serial label matches your local AC power voltage. If your AC power voltage is outside the range indicated, do not use the machine. Contact MSS Professional for assistance.

Fluid system

DANGER! A smoke machine can run safely only on the specific smoke fluid or fluids it is designed for. Use ONLY Martin Security Smoke Trainer Fluid in the Trainer 201. NEVER operate the machine with any other type of fluid, or toxic gas may be produced. You will probably also cause damage to the machine that is not covered by the product warranty.

Fluid type

The type of fluid used affects the density and persistence of the smoke produced. Two fluids are compatible with the Trainer 201:

- Martin Security Smoke Trainer Fluid Medium gives a medium-density smoke with medium persistence, and is suitable for general use.
- Martin Security Smoke Trainer Fluid Heavy gives a higher density smoke with higher persistence. This fluid is suitable for large areas and where maximum smoke density is required.

Fluid capacity

Important! **Check the fluid level regularly. Do not allow the Trainer 201 to run out of fluid. Attempting to operate the machine with no fluid may cause damage that is not covered by the product warranty.**

The Trainer 201 has an on-board container with a capacity of 2.5 liters (5.3 US pints/4.4 Imp. pints), giving approximately 1 hour 20 minutes of continuous operation at full output. Maximum continuous operation time and maximum continuous output level vary slightly at different input voltages.

Continuous output and pump ramping

The Trainer 201 uses a technique called 'pump ramping' to allow continuous smoke output during the entire operation period. When the output level is set to maximum, the machine gives maximum output for approximately 1 minute, until the heat exchanger has used its energy reserves. The pump ramping system then reduces the output level, overriding the output level setting, for the rest of the operation period. This system ensures that output is continuous.

Filling with smoke fluid

Important! Keep smoke fluid and all components in the fluid system free of dust, dirt, fluff and any form of contamination.

Do not shake or vibrate the fluid container or machine, as this will create air bubbles in the fluid. Excessive bubbles impair performance and may cause damage to the heat exchangers that is not covered by the product warranty.

To fill the Trainer 201 with smoke fluid:

1. Isolate the Trainer 201 from power.
2. Fit a full container of Martin Security Smoke Trainer Fluid into the fluid compartment and remove its cap.
3. Check that fluid and all components are totally free of dirt, fluff and other small particles. Impurities will clog the machine and make service or repair necessary.
4. Install the Trainer 201's fluid adaptor cap complete with fluid lines tightly on the fluid container, ensuring that the suction tube reaches the bottom of the container.
5. When using the machine for the first time or after fluid containers have been changed, prime the pump (see below).

Priming the fluid pump

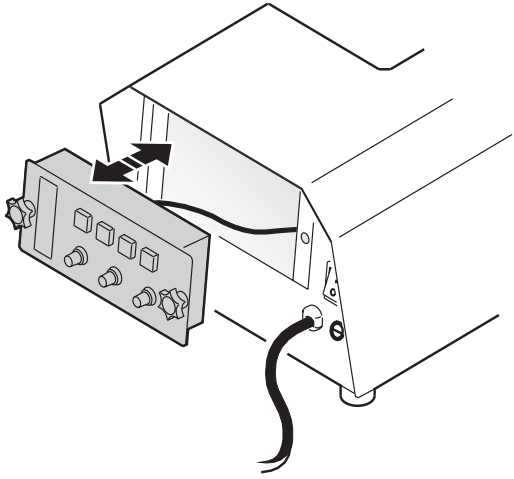
When using the machine for the first time or after fluid containers have been changed, the fluid pump must be primed. To prime the pump:

1. Apply power and allow the machine to warm up.
2. When the READY LED on the machine lights, turn the OUTPUT knob on the remote control fully clockwise to set the machine to maximum output.
3. Use the FOG button to fire the machine for approximately 10 seconds or until smoke is produced at the output nozzle.

If smoke is not produced within 20 seconds, there may be a problem with the fluid system. Refer to "*Troubleshooting*" on page 18 for fault-finding procedures.

Remote control unit

The Trainer 201 is supplied with a cable remote control unit connected and secured with two thumbscrews in its on-board docking station.



The remote is connected to the Trainer 201 via a hard-wired 6m (19.5 ft.) cable and 3-pin XLR connector. A longer cable can be fitted, up to a maximum cable length of 25 m (82 ft). Standard microphone cable can be used. The pin configuration of the remote connection is:

- Pin 1: Ground
- Pin 2: +16 V output from machine
- Pin 3: 0 - 10 V input to machine

Power the Trainer 201 off before disconnecting or connecting the remote control unit.

Ducting

The optional smoke ducting adaptor available from MSS Professional allows the Trainer 201 to be connected to standard 100 mm (4-inch) flexible smoke ducting. The adaptor allows air to mix with the smoke output before it enters the ducting.

DANGER! Do not use any other method than the MSS Professional ducting adapter to connect smoke ducting to the Trainer 201, or you may cause moisture buildup with a risk of electric shocks or damage to the machine that is not covered by the product warranty.

Good results are obtained with smoke ducting up to 20 m (65 ft.) total length.

Avoid sharp bends as far as possible, as these encourage condensation.

Ensure free and unobstructed airflow to the space between the output nozzle and the entry to the smoke ducting.

Operation

DANGER! Do not try to operate the Trainer 201 until you have read and observed all the precautions listed in "*Safety information*" on page 3.

IMPORTANT! Do not allow the Trainer 201 to run out of fluid, as this may cause serious damage to the product that is not covered by the warranty.

Starting the Trainer 201

Before operating, check that the Trainer 201 is correctly and safely installed, that the fluid container is filled with enough fluid (see "*Fluid system*" on page 10), and that the remote control is connected.

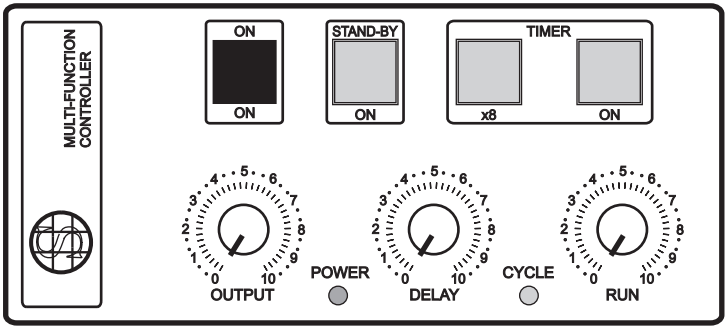
To start the Trainer 201 from a 'cold' state:

1. Connect the Trainer 201 to power, and switch on at the power switch on the machine.
2. Set the Standby switch on the remote control to ON.
3. The remote control becomes functional when the READY LED on the back of the Trainer 201 lights after approximately 7 minutes warm-up time.

If you are starting the machine for the first time or after the fluid has been changed, the pump may need to be primed. Do this by setting OUTPUT to maximum and firing the machine for 10 seconds or until smoke is produced.

Operating with the remote control

The Trainer 201 can be controlled using the multifunction cable remote as described below:



A – ON: When the machine has reached operating temperature, press and hold this button to produce instant smoke output.

B – STAND-BY: Puts the machine into standby mode. Switch to ON for warm-up and operation.

C – TIMER x8 When using the timer, increases timer values by a factor of 8, so that for example a 5 second run time becomes 40 seconds and a 10 second delay time becomes 1 minute 20 seconds.

D – TIMER ENGAGE: Engages the timer to produce smoke according to the OUTPUT, DELAY and RUN settings.

E – OUTPUT: Turn clockwise to increase smoke output, Turn fully counter-clockwise for zero output.

F – POWER: This LED lights when the machine is switched on.

G – DELAY: Turn clockwise for longer intervals between smoke output periods when the timer is engaged.

H – CYCLE: This LED lights when the timer is engaged and the machine is operating.

I – RUN: Turn clockwise for longer smoke output periods when the timer is engaged.

Basic service

DANGER! Do not try to service the Trainer 201 until you have read and observed all the precautions listed in "*Safety information*" on page 3.

Any service not described in this section must be carried out by a service technician authorized by MSS Professional. Please refer to MSS Professional for assistance with obtaining service.

Fluid system

DANGER! Use ONLY Martin Security Smoke Trainer Fluid in the Trainer 201. NEVER operate the machine with any other type of fluid, or toxic gas may be produced. You will probably also cause damage to the machine that is not covered by the product warranty.

For general information about the fluid system, see "*Fluid system*" on page 10.

For instructions for filling the Trainer 201 with smoke fluid, see "*Filling with smoke fluid*" on page 11.

Fluid filter

The Trainer 201 uses a washable filter on the end of the smoke fluid suction tube. Check that the filter is perfectly clean each time you change or refill the smoke fluid container.

If the filter is dirty or contaminated, wash in clean water until perfectly clean or replace with a new item.

Cleaning

Excessive dust, smoke fluid, and dirt buildup will degrade performance and cause overheating and damage to the machine that is not covered by the product warranty. To maintain adequate cooling, dust must be cleaned from the outer casing and air vents periodically.

Isolate the machine from power and allow to cool completely before cleaning. The nozzle area can remain hot for several hours after use.

- Remove dust from the air vents on the side of the outer casing with a soft brush, cotton swab, vacuum, or compressed air.
- Clean the outer casing with a damp cloth only.

- Ensure that the nozzle area ia completely cool, then wipe up any smoke fluid residue from the nozzle and surrounding area with a damp cloth.

Replacing a fuse

DANGER! Disconnect the machine from AC power before removing or installing a fuse. Never attempt to bypass a fuse or replace a fuse with one of a different type and/or rating. If a new fuse blows shortly after it is installed, stop using the machine and contact MSS Professional for assistance.

If the main on/off switch and the power LED on the remote do not light when power is applied, the main fuse may have blown. To replace the fuse:

1. Isolate the machine from power and allow to cool.
2. Use a flat-headed screwdriver to open the main fuseholder next to the power cable entry.
3. Replace the main fuse with one of the same type and rating only (see "*Electrical*" on page 20 for fuse details).
4. Reinstall and tighten the fuseholder before reapplying power.

Troubleshooting

Problem	Probable cause(s)	Suggested remedy
No fog output when the machine is fired using the FOG ON or TIMER functions	Machine is not ready	Allow time to warm up
	Fluid is below minimum level	Add fluid
	Standby switch is OFF	Set Standby to ON
	Timer on period (RUN) is set to level 0	Set RUN to at least level 1
Machine is not ready after 7 minutes heating time	Standby switch is OFF	Set Standby to ON
	Electrical malfunction	Refer to MSS Professional
Fog disperses too quickly	Density level too low	Increase OUTPUT setting on multifunction remote
POWER LED on remote does not light when power is applied, and smoke cannot be produced.	Remote control not correctly connected	Check connection
	Power not correctly connected	Check connection
	Main fuse blown	Replace
	Electrical malfunction	Refer to MSS Professional

Trainer 201 specifications

Physical

Dimensions (L x W x H) . . . . . 500 x 225 x 165 mm (20 x 9 x 6.6 in.)
Shipping dimensions (L x W x H) . . 670 x 310 x 300 mm (26.4 x 12.2 x 11.9 in.)
Weight (without fluid) . . . . . 11 kg (24.2 lb.)
Weight (with fluid) . . . . . 13.5 kg (29.8 lb.)

Performance

Maximum smoke output . . . . . 500 cubic meters (17 600 cubic ft.) per minute
Maximum operating time at full output . . . . . Approx. 1 hour 20 minutes
Operating time . . . . . Continuous, automatic output level adjustment
Warm-up time . . . . . Approx. 7 minutes

Control

Multifunction cable remote, 0-10 V analog
Instant smoke, stand-by, timer X8 and timer engage push-buttons
LED power and timer cycle indicators
Independent output level, timer delay and timer runtime controls
Timers: 2 - 144 sec.delay, 2 - 144 sec. runtime

Installation

Minimum clearance in front of output nozzle . . . . . 1 m (40 inches)
Minimum free space around machine . . . . . 10 cm (4 inches)
Minimum distance to combustible materials . . . . . 60 cm (24 inches)
Orientation . . . . . Maximum 30° from horizontal
Minimum ambient temperature . . . . . 5° C (41° F)
Maximum ambient temperature . . . . . 40° C (104° F)

Heat exchanger

Heater . . . . . 1 kW (at 240 V)
Thermal protection . . . . . Direct ceramic thermal trip device
Temperature control . . . . . Electronic (thermocouple)

Fluid system

Approved fluid . . . . . Martin Security Smoke Trainer Fluid, Medium or Heavy
On-board fluid capacity . . . . . 2.5 liters (5.3 US pints/4.4 Imp. pints)
Fluid consumption at max. continuous output . . . . . 75 ml per minute
Fluid pump . . . . . Piston, high pressure
Pump startup . . . . . Soft start electronics

Electrical

115 V model

AC power . . . . . 110-120 V, 60 Hz nominal
Power and current* . . . . . 1070 W, 9.72 A
Main fuse. . . . . T 15 A (slow blow), 250 V

230 V model

AC power . . . . . 220-240 V, 50 Hz nominal
Power and current* . . . . . 1070 W, 4.45 A
Main fuse. . . . . T 6.3 A (slow blow), 250 V

*At nominal voltage. Your local voltage may fluctuate. Allow for +/- 10% variation.

Connections

Power inlet . . . . . Hard-wired grounding (earthed) 2 m (6.5 ft.) cable tail w/o plug
Cable remote control connection . . . . . 3-pin XLR
Ducting. . . . . Optional adaptor for 100 mm (4 inch) flexible ducting

Approvals

This product meets the requirements of the following EC Standards, and as such complies with the EMC and LVD directives of the European Community:

CE

European EMC: . . . . . EN 50 081-1, EN 55 014, EN 55 022 /B, EN 60 555
European safety: . . . . . EN 60 335-1
Immunity: . . . . . EN 50 082-1, IEC 801-2, IEC 801-4

Included Items

Multifunction remote control with 6 m (19.5 ft.) cable

Accessories

2.5 liter container, MSS Professional Trainer Fluid Medium . . . . . P/N 97121223
2.5 liter container, MSS Professional Trainer Fluid Heavy. . . . . P/N 97121226
9.5 liter container, MSS Professional Trainer Fluid Medium . . . . . P/N 97121224
9.5 liter container, MSS Professional Trainer Fluid Heavy. . . . . P/N 97121227
25 liter container, MSS Professional Trainer Fluid Medium. . . . . P/N 97121225
25 liter container, MSS Professional Trainer Fluid Heavy . . . . . P/N 97121228
MSS ducting system incl. 5 m of 100 mm (4-inch) ducting . . . . . P/N 92622024

Ordering information

Trainer 201, 115 V, 60 Hz . . . . . P/N 92256110
Trainer 201, 230 V, 50 Hz . . . . . P/N 92256100

Specifications subject to change without notice.

Supplier

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